

Patent Application
Docket No. 45688-00002USPT

In the Claims:

1. (Currently Amended) A flip-chip light-emitting device, comprising

a transparent substrate comprising a main surface and a surface opposite to said main surface, wherein said surface opposite to said main surface is the light-emitting surface of said device;

a semiconductor stacked structure arranged over a said main surface of said transparent substrate wherein said stacked structure comprises an n-type GaN-based III-V Group compound semiconductor layer adjacent to said main surface and a p-type GaN-based III-V Group compound semiconductor layer adjacent to said n-type semiconductor layer;

a first electrode being in electrical contact with said n-type semiconductor layer,

and

a second electrode being in electrical contact with said p-type semiconductor layer;

wherein said second electrode has good reflectivity of light and, covers most of the outer surface of said p-type semiconductor layer and is positioned opposite to said light-emitting surface of said substrate.

2. (Original) The device of Claim 1 wherein said stacked structure further comprises an active layer placed between said n-type semiconductor layer and said p-type semiconductor layer.

3. (Original) The device of Claims 1 or 2 further comprising an insulating layer at least coated on the side surface of the stacked structure, a portion of said first electrode and a portion of said second electrode.

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1 4 (Original) The device of Claims 1 or 2 further comprising a base which has a first
2 and a second conductive portions respectively connected to said first and second electrodes.

1 5 (Original) The device of Claim 4 wherein said base can be a conductive lead frame, a
2 glass lead frame, a circuit board or a thin-film circuit.

1 6 (Original) The device of Claims 1 or 2 wherein said second electrode is a multi-layer
2 structure comprising a light-transmitting conductive layer and a layer of aluminum (AL) or silver
3 (Ag).

1 7 (Original) The device of Claims 1 or 2 wherein said second electrode is a multi-layer
2 structure of nickel/gold/titanium/ aluminum (Ni/Au/Ti/Al), Indium-Tin Oxide/aluminum
3 (ITO/Al) or Indium-Tin Oxide/silver (ITO/Ag).

1 8. (Currently Amended) A flip-chip light-emitting device, comprising:
2 a transparent substrate comprising a main surface and a surface opposite to said
3 main surface, wherein said surface opposite to said main surface is the light-emitting surface of
4 said device;

5 a semiconductor stacked structure arranged over [a] said main surface of said
6 transparent substrate wherein said stacked structure comprises an p-type GaN-based III-V group
7 compound semiconductor layer adjacent to said main surface and a n-type GaN-based III-V
8 Group compound semiconductor layer adjacent to said p-type semiconductor layer;

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9 a first electrode being in electrical contact with said n-type semiconductor layer;
10 and
11 a second electrode being in electrical contact with said p-type semiconductor
12 layer,
13 wherein said first electrode has good reflectivity of light ~~and~~, and covers most of
14 the outer surface of said n-type semiconductor layer and is positioned opposite to said light-
15 emitting surface of said substrate.

1 9. (Original) The device of Claim 8 wherein said stacked structure further comprises an
2 active layer placed between said n-type semiconductor layer said the p-type semiconductor layer.

1 10. (Original) The device of Claims 8 or 9 further comprising an insulating layer at least
2 coated on the side surface of the stacked structure, a portion of said first electrode and a portion
3 of said second electrode

1 11. (Original) The device of Claims 8 or 9 further comprising a base which has a first
2 and a second conductive portions respectively connected to said first and second electrodes.

1 12. (Original) The device of Claim 11 wherein said base can be a conductive lead frame,
2 a glass lead frame, a circuit board or a thin-film circuit.

1 13. (Original) The device of Claims 8 or 9 wherein said second electrode is a multi-layer
2 structure comprising a light-transmitting conductive layer and a layer of aluminum (Al) or silver
3 (Ag)

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- 1 14. (Original) The device of Claims 8 or 9 wherein said second electrode is a multi-layer
- 2 structure of titanium/aluminum (Ti/Al), titanium/silver (Ti/Ag), Indium-Tin Oxide/aluminum
- 3 (ITO/Al) or Indium-Tin Oxide/silver (ITO/Ag).